Stimulation of information diffusion in social network with
respect to time in social network using CUDA

Parallel Processing course assignment 1

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To compile :nvcc social_network.cu -lm
To run : ./a.out
Dependencies : CUDA enabled GPU, CUDA toolkit 4.0 or above , CUDA driver

GIT HUB LINK : https://github.com/gourab88/PP_ASSIGN

This program will model information diffusion in social network with
respect to time.

Topic Arrival & Person arrival is modeled after
possion arrival.
It will output No of copies of each topic
in each time interval to highlight the
variation of popularity of topics over time.

Main Data structures

Social graph structure is stored in two arrays V (of size no of vertex) and E (of size twice no of edges)
each v[i] holds a value t where
t is the index of E from where we store the neighbors of Vertex i.
if V[i]=t1 and v[i+1]=t2
Neighbors of vertex i are stored from E[t1] to E[t2-1];

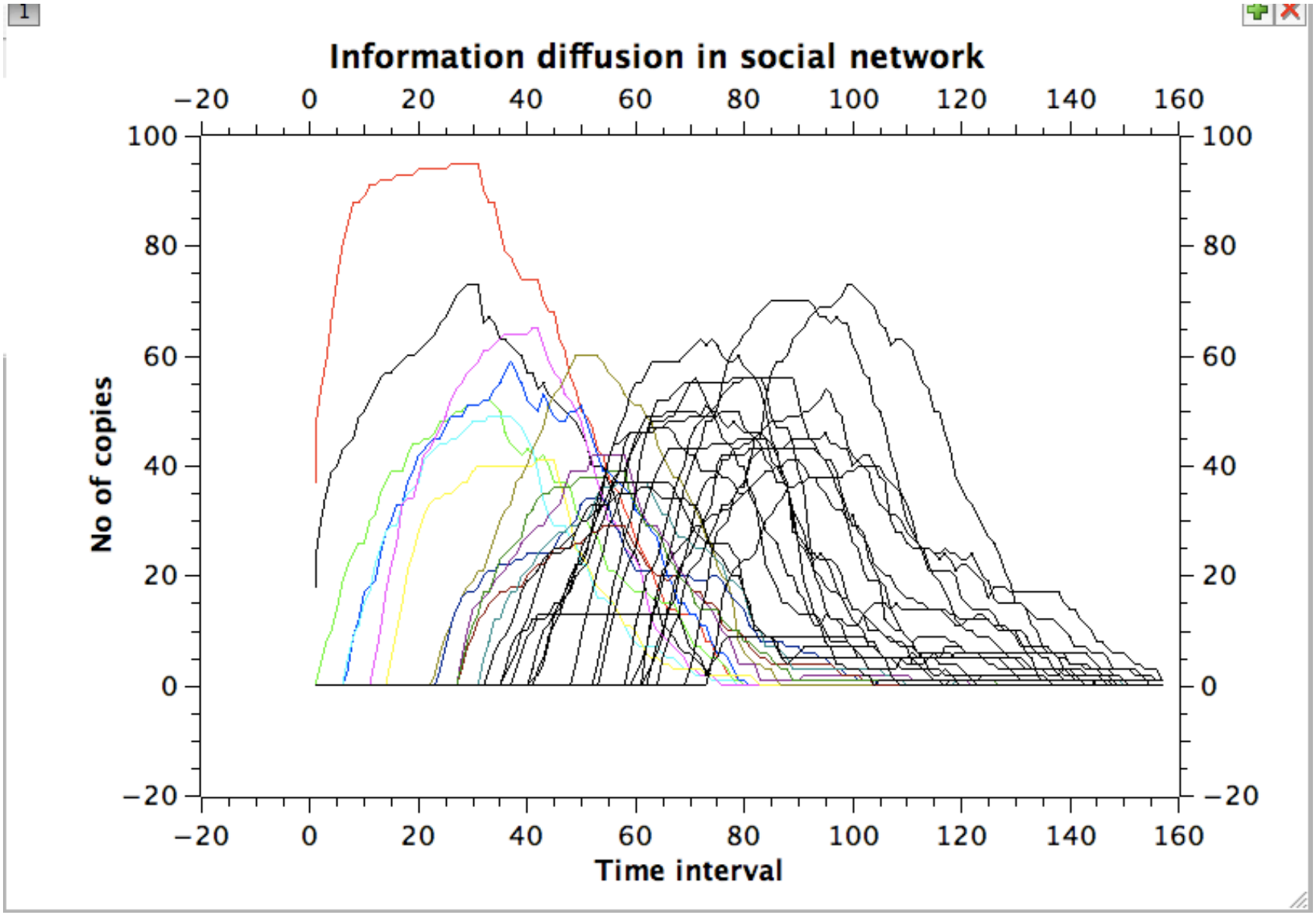
No of neighbors of vertex i =t2-t1

Main Approach

1. Generated initial Arrival list of users modeled after Poisson arrival.
2.Generated initial Arrival list of topics modeled after Poisson arrival.
3. Divide the total timeline into predefined time intervals.
4. Initialize the social graph by randomly given topics.
5. For each time interval each active user can adopt a topic from global list or from its friends' list probabilistically.
6. Exploit parallelism for step 5.
7. Decay the weight of topics in local list of each user as well as in global list.
8. Keep track of no of topics of each topic in each time interval
9. Plot a graph a of no of each topics with respect to time.

See Graph in next page...

Graph :


1
Information diffusion in social network
No of copies
Time interval
−20
0
20
40
60
80
100
120
140
160
100
80
60
40
20
0
−20